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THE PSYCHOLOGICAL BASIS OF HEGELISM.

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I have already published in the *American Journal of Psychology*¹ what may be considered two contributions towards a new phase of psychological science, viz., the Psychology of Philosophy. As far as I am aware the method of treatment of philosophical systems used in these articles is almost entirely new. It aims at giving the psychological basis of the most fundamental principles of the various systems, and substituting for the mysticisms of the old philosophy more accurate categories obtained by scientific experiment. My first paper offers an examination of the philosophical systems of Hobbes, Locke, Berkeley and Hume from the standpoint of Visualization; in which I attempted to show that many of the chief characteristics and short-comings of these systems have their fundamental basis in the psychological process of Visualization. In the other I have endeavored to point out an important group of conceptions, especially those of Natural Realism, which have their psychological history in the sense of touch. Now I propose to offer a third contribution of the same nature, in which I shall endeavor to trace the influence of the discovery of galvanism in determining the great system of philosophy presented by Hegel.

In the development of the sciences there is perhaps no factor more potent than the psychological process of apperception. The development of the sciences undoubtedly does not take place according to any eternally fixed order, but rather through mutual influences, which are in many cases to a great extent accidental. The various sciences are necessarily interdependent; and out of this direct interdependence which gives rise to reciprocal action between them, there arises an opportunity for the constant activity of a great and powerful influence in determining their development, namely, that process which, since the time of Herbart, is known in psychology by the name of "apperception." The conception gained through the experience of an interesting fact in one department of science serves as an "apperceiving type" for the cognition of newly presented phenomena in other departments. Thus the law of gravitation once observed in a particular phenomenon soon appeared as the fundamental type of all physical action. Everything having the appearance of natural motion or force began to look like one more illustration of the law of gravitation. The discovery of the polarization of light was followed by the apperception of the polarization of heat. The refrangibility observed in light and heat led to the hypothesis of the refrangibility of sound. The theory that evaporation is a solution of water in air was an unconscious assumption that water and air stand to each other in a relation similar to that between salt and water. The theory of the atomic repulsion of the particles of the evaporating fluid, as an ex-

¹ Vol. IV, Nos. 2 and 3.

planation of the diffusion noticed in evaporation, originated by reading into this phenomenon conceptions gained from the observation of electric repulsion. Of such apperceptive knowledge the whole intricate web of scientific theory is full. And this is the particular psychological agency which we must keep constantly in view in tracing the influence of the discovery of galvanism on the mass of scientific and philosophic speculation which led to the production of the Hegelian system.

The phenomenon of attractive and repulsive agency observed in magnetism has long served as a type of scientific and philosophic apperception, and among the ancients as well as among the moderns has often formed the basis of the wildest and most extravagant mysticisms. In the earliest stages of physical and astronomical science all cosmical interactions, all actions between bodies at a distance, could be made intelligible only when classed under the general type of magnetic attraction or repulsion. Everything novel or strange in the shape of attractive or repulsive force, in any department of experience, naturally tended to be apperceived by the mystic mass of ideas gained from observation of magnetic action. So Gilbert tells us, in his "De Magnete," that "the magnet and amber were called in aid by philosophers as illustrations, when our sense is in the dark in abstruse inquiries, and when our reason can go no further." In these earlier times, however, the phenomenon of magnetism stood apart from the great body of intelligible experience as an isolated fact, strange and mysterious in its nature. All facts and all systems of facts, accordingly, apperceived under this type, were on their very face mysticisms of the most mystical calibre. Very different is it, indeed, in the case of that period of discovery and speculation with which we have to deal in tracing that development towards a scientific consensus which followed upon the famous discoveries of Galvani and Volta. In this period magnetic or electric agency still characterizes the "apperceiving mass" dominant in the speculation, but it is no longer an isolated fact: it is now scientific—closely interwoven into, and widely spread throughout, the whole net of scientific experience. In this period we find the electric category of "polarity" presenting itself as the fundamental principle in all the sciences; weaving itself rapidly, through the instrumentality of enthusiastic experimentation, into the basal network of Physics, Chemistry, Mineralogy, Morphology, Anatomy, Physiology, the medical sciences, the social sciences, and various departments in the great body of facts which pertain to general experience. In this period, in short, we find the principle of electricity as it was observed in galvanism accepted as the most satisfactory explanation possible of the fundamental facts of nearly all departments of knowledge; many facts, indeed, which in the light of modern science are as far from finding their explanation in this way as the east is from the west. In this period, consequently, facts apperceived under the type of magnetic or electric agency savored not the least of mysticism, but appeared truly scientific in their inmost fibre.

This difference between electric agency as an apperceptive type among the ancients and as an apperceptive type in the scientific period following the discovery of galvanism, illustrates a very important law of apperception. The one all-important thing which determines to what extent any observed phenomenon shall serve as an apperceiving "mass" for other phenomena is the *interest* which it excites. To the ancients the phenomenon of magnetism was not of universal interest. In fact it was of no *real* interest; it was rather a matter of curiosity. The discovery of galvanism, how-

ever, seemed to carry within it a source of interest most real and intense—an interest that bordered on the wildest excitement. And now it becomes our investigation to inquire into this source of interest. Why all this enthusiasm following the discovery of galvanism? Why should electricity suddenly take such a freak and violently force itself into so many departments of knowledge into which modern science says it had no right to go? What was there about the nature of galvanism that it should excite so much interest?

The great excitement which Galvani's experiments caused all over Europe was due principally to a circumstance in connection with his first discovery, which was purely accidental and unessential to the true value of the science. This circumstance was the intimate connection of the experiments with the animal organism and the phenomena of life. In its first announcement Galvani's discovery was given forth as a manifestation of electricity under a new and remarkable character, namely, as residing in the muscles of animals. The limbs of a dissected frog when touched with two heterogeneous metals were observed to repeat almost all the motions of life. This fact once observed, the first psychological tendency was to secretly suspect—and with great enthusiasm too—the probability that life was identical with electricity. And this once suspected, what could be more attractive than a headlong rush into the investigation of electricity or galvanism? Experiments performed on executed criminals met with such wonderful results that men began to hope that ere long the dead could be raised. Life apparently revived! A thorough knowledge of galvanism will give command over all the forces of life! Inspired by such phantom hopes men waxed enthusiastic and were carried off their feet. A new sun appeared on the scientific horizon in the intoxicated minds of its worshippers. A new sun-myth began to crystallize; a great scientific mythology began to dawn. Introduced in such a spirit of enthusiasm, Galvani's experiments were repeated, with various modifications, in all parts of Europe, exciting the greatest curiosity and giving rise to the most extravagant speculations. The study of galvanism soon became of paramount interest, not only to those actively engaged in scientific investigations, but even to many who were not. Valuable prizes were founded on all sides expressly for promoting its prosecution. Scientific institutions and societies, as well as individual scientists, made it their problem of special research. Commissions from various institutions and societies throughout Europe were appointed to investigate the wonderful results obtained by Galvani and Volta. Not narrow or restricted in its scope, but flashing its magic light into all recesses of scientific research, representatives of all departments of knowledge, Physics, Chemistry, Physiology, Medicine, Biology, Psychology, etc., were found busily engaged in experiment, with a view to its application in their particular subjects of investigation.

The importance of galvanism in the history of science is indeed not less than it was estimated by the great band of enthusiasts who devoted themselves to the speculations to which it gave rise in the first stages of its history; but its permanent scientific value is of a character altogether different from that which suggested itself to their minds. In every great scientific discovery two kinds of value can always be observed. First there is its value as estimated by those who care for it in its childhood—a value which generally passes off into a mass of speculation, and is interesting afterwards only to the psychologist. Secondly, there is its true scientific value into which it finally settles down—a value which remains per-

manent throughout all further development of the science. The real scientific value of the discovery of galvanism consists in none of the speculations to which it at any time gave rise, but in the practical means and many advantages which it ultimately afforded for the observation of a larger number of facts in various departments of science. But in this permanent scientific value we are here not interested; our interest is in its other value—the mystic value attached to it in its infancy. Our interest centres in that apperceptive type of speculation which hovered about all the earlier experiments,—a type of speculation which is well illustrated by a story told of Napoleon Bonaparte just after he had called Volta to Paris. After seeing the decomposition of salts by the voltaic pile, he turned to Corvisart, his physician, and said: “Here, doctor, is the image of life; the vertebral column is the pile, the liver is the negative, the bladder the positive pole.”¹ Such speculation as this is deeply interwoven into the inmost fibres of nearly all the thought of scores of the greatest German scientists of the latter part of the eighteenth and the beginning of the nineteenth century.

In its circulation through the various sciences, galvanism had two main avenues of approach. One was the science of chemistry, with which it was essentially connected; the other the science of physiology, with which it was accidentally connected.

In the department of chemistry, the decomposition of binary compounds by the “pile” laid the foundation of the whole so-called “electro-chemical” theory. From the wonderful facts collected by numerous experiments along this line, quite early in the history of galvanism, a great theory of modern science was suspected and maintained, viz., the identity of chemical and electrical energy. The chemical *composition* of the fluid with the zinc in the voltaic pile, produces, when the current is completed, a current of electric influences in the wire; and this current, if it pass through an electrolyte, manifests itself there as *decomposition*, overcoming the chemical affinity which resists it. The true scientific bearing of this fact was not properly understood until the time of Faraday. What we want to see, however, is in what way it was understood by his predecessors. That these two sets of phenomena, the electrical and the chemical, were identical in principle, was undoubtedly apprehended and maintained. But in what way was the common principle apperceived? We find that the common principle was still the principle of electricity. Instead of electrical and chemical action being both referred to a common energy which manifests its nature in these two different ways, both were referred to electric agency. The whole process, including chemical and electrical action, was apperceived under the type of electric action. Thus the forces at the point of composition and at the point of decomposition were conceived to be the same force; but this force was looked upon as manifesting itself in the mystical polar opposition of the poles of the magnet or the positive and negative in electricity; composition and decomposition were polar opposites. In the recognition of the intimate relation between the two sciences, the chemical aspect of the supposed common agency underwent severe criticism, but the one thing that remained throughout uncriticised was the electrical aspect. Consequently, it served as the apperceiving “mass” for the facts of chemistry. Thus Berzelius, the great Swedish chemist, and a host of German chemists considered that the descriptions in all

¹ Becquerel, *Traité d'Electricité*.

chemical combinations might be "polar." All chemical elements could be considered as electro-positive and electro-negative. All elements were thus classified: Hydrogen, Oxygen, Acid, Alkali, etc. And this "polar opposition" they made the basis of all their chemical doctrines. In the enthusiastic apprehension of this polar relation of the chemical elements, all their phenomenal or sensible qualities were lost to view. The relation of polarity was conceived to constitute the very *essence* of the elements. Hydrogen, for example, was conceived to have its whole being and essence in its polar relation to other elements, just as the north pole of the magnet was conceived to have the essence of its being in its polar opposition to the south. As Oken puts it, "The whole principle or rationale of chemical action consists in the potentiality of two elements to revert to their polar condition." Or, as Hegel puts it, "Objects chemically charged with difference are what they are expressly by that difference alone."

The same tendency of speculation is also exhibited in the science of mineralogy. As the elements of all compounds could be described as polar, that is, could be distinguished as electro-positive and electro-negative, thus giving to every element a place in a series defined by the degree of these relations, the electro-chemical hypothesis seemed to afford a rigorous and complete system of arrangement for the minerals. Accordingly, at one time, we find them arranged according to their electro-positive element, and the elements according to their electro-positive rank; at another time, according to their electro-negative element, and the elements according to their electro-negative rank. Such systems of classification were supported by such men as Berzelius, Gmelin, Bendant and Norden-skiöld; and seemed thoroughly justified by the state of science at the time. Thus in mineralogy, as in chemistry, the tendency of thought which naturally grew out of the exaggerated estimation of the category of "polarity" was to entirely lose sight of the phenomenal or material element. The external properties of minerals, which are the proper object of the study of mineralogy, were made to depend wholly on the electrical relations of their elements. "Such schemes," says Mr. Whewell, in his "History of the Inductive Sciences," "exhibit rather a play of the mere logical faculty, exercising itself on assumed principles, than any attempt at the real interpretation of nature."¹

From the side of physiology, the investigations were even more enthusiastic. As the experiments were carried on by all the most active scientists of Europe, especially by the Humboldts in Germany, the various phenomena of physiology, one by one, began to exhibit themselves as manifestations of electric agency. In the animal organism, the relation between whole and part was conceived to be that of polar opposition—that mystical "difference in unity" which exhibits itself originally in the phenomena of magnetic and electric action. Muscular contraction was explained as the mutual electric repulsion of the fibres which, on account of their being fastened at the extremities, caused the muscle as a whole to contract. Again the underlying principle of all nervous activity was explained on electrical principles. Alexander von Humboldt made laborious and tedious attempts to explain "nerve currents" and "sympathy" between nerves by electrical "conduction." The animal organism was looked upon as an actual voltaic pile. The solid and fluid parts together formed a galvanic circuit, as did the metals and fluid in Volta's pile. Every irritation, sensation and movement was con-

¹ Vol. III. p. 243.

ceived to be a manifestation of this galvanic agency. Thus Prochaska explains sensation: Any irritating body brought into contact with the organism forms a new link in its galvanic circuit of solid and fluid parts, which causes a quantitative and qualitative change in the electrical tension, which is conducted by the nerves to the brain, and this produces sensation. So also "reflex action." Reflexes, he says, are "founded on electrical attraction and repulsion of advantageous or injurious irritations, according as the *polarities* of the organ and the irritation are identical or opposite," etc., etc.

Into the science of morphology, too, the electrical category worked its way. For example, cells were viewed as standing to one another in the relation of polar opposition. Cell-division was an illustration of electricity differentiating itself into the opposite forms of positive and negative. The accumulation of cells into groups again took place on the principle of electric attraction. By some, the whole process of evolution in the animal kingdom was conceived to be nothing more nor less than a galvanic process exhibited in an endless number of variations. Thus we find such theories as: The male corresponds to the positive and the female to the negative pole. The infusorium is a galvanic point, a galvanic vesicle, a galvanic column or chain.¹ Every change in the process of evolution takes place through the differentialization or the absolute of fixed poles. The number of individual organisms is not persistent; they present the aspect of constant change. They are products of a ceaseless *polarization* or a constant evocation of poles in the great galvanism, positions of the general galvanism in time. As the poles change, so also do the organic individuals. The kingdom of organisms is an iron bar in which the magnetic poles originate and vanish or change, according as the polarizing magnet is removed.¹ Organism itself is galvanism. What would be organic must be galvanic; what would be alive must be galvanic. Galvanism lies at the basis of all organic constitution; it is the rationale of organism. All organic processes are either modifications of it or only its combinations with other and still higher processes, etc., etc.

Not only the partial processes of physiology and the historical changes of morphology were doomed to be explained after this fashion; the same kind of explanation was ardently applied to the higher principles of life and thought. The vital principle was galvanism. We have many illustrations of this doctrine in the history of medicine, especially in the theories of that group of physicians commonly designated as the "natural-philosophical school."² John Christian Reil (1759-1813) was probably the first to clearly state the doctrine. According to him, the *vital process* was *galvanism* — a potentialized galvanism. Irritability and sensibility are the two poles. Every organ manifests "polarity." The diaphragm is the indifferent point of the body. "Tension" prevails everywhere between organic and inorganic beings. Death arises from an electric shock by which a neutralization of the "tensions" is accomplished. In this doctrine, he was followed, with more or less variation, by numerous others. Dietrich, G. Rieser (1779-1862), professor at Jena, maintained that "polarity, conceived as a phenomenon, is the basis of everything, since life is understood as an oscillation between a positive and negative pole, and the vital principle as the organic tension which kindles and supports this oscillation." Ignaz Troxler (1790-1866), professor at Berne, conceived the various vital

¹Oken. *Physo-philosophy*.

²See Bass, *History of Medicine*.

processes to stand in polar relation to one another: Excretion, secretion, respiration, digestion, etc. Excretion is secretion directed externally, and secretion is excretion directed internally. Respiration and digestion are identical in their essential tendencies and differ only in their relative direction. Life in its inmost character is individual productivity, in which the producing agent and the product are interwoven under the form of self-determination. This idea of self-determination, in which the producing agent and the product are indivisible, is the idea of self-differentiation as manifested in electricity. A similar view was held by Ph. Franz von Walther (1782-1849), professor of surgery, successively at Landshut, Bonn and Munich. He held the true essence of the organism to be that "it admitted no division of the idea of life." The primordial function of life is "self-production," "to which corresponds, in organic nature, magnetism." The original differentiating principle is apperceived under the type of magnetic differentiation. It differentiates itself into the two poles, irritability and sensibility, the former of which corresponds to electrical and the latter to chemical action. This was also the doctrine of Schelling, and of Hegel, too, though perhaps in a disguised form. Among the pupils of Schelling who were mainly physicians, we find the same doctrine carried out to its extremes. All the phenomena and processes of life, and indeed of all nature, were arranged according to "polarities." Everything in nature was polar: Man, woman, irritability, sensibility, subjectivity, objectivity, electricity, magnetism, oxygen, hydrogen, acid, alkali, etc., etc. Here again we see illustrated the fatal tendency of the "polarity-myth." The whole value of empirical facts of all kinds is lost to view, spiritualized away under the mystical metaphor, and the only real thing left in all nature seems to be the relation of polarity. Among those who supported this exaggerated theoretic type of doctrine were also C. H. Pfaff, Humboldt, J. F. Ritter, Rheinholdt, Prochaska, Brandis, Treviranus, Bischoff and Gropengieser.

In the department of psychology the influence of galvanism is well illustrated in the theory of animal magnetism. A great portion of the literature on hypnotism, even up to the present time, is saturated with the mysticism of this doctrine. At the time which we have now under consideration, we find this theory supported by nearly all the physicians already mentioned; also by A. E. Kessler, Wolfart, Prof. Kluge (a special Berlin authority), Hufeland, Eschenmayer, Kieser, Nasse, Walther, Ennemoser, and others.¹ The phenomenon of somnambulism in the hypnotic state was explained thus: The brain with all its dependent organs of motion was regarded as the positive or conscious pole; the sympathetic nerve, with its tissue of ganglia, as the negative or unconscious pole. In the somnambulist state the vital power is driven from the brain or conscious pole to the sympathetic nerve or unconscious pole, whose larger tissues, especially the "plexus solaris," are turned into a "sensorium," which, as if by substitution, performs the functions of the brain. This was supposed to account for the assertion by somnambulists that their consciousness has its seat in the pit of the stomach. The influence of the magnetizer on the patient was regarded as the action of the outer nervous pole (the brain) of the magnetizer on the corresponding positive pole of the patient, the former repelling the latter, according to the general law of polarization, by which means the nervous power of the magnetizer is concentrated on the nega-

¹ For a full account of these physicians see Bass' History of Medicine.

tive pole of the inner nervous system, the ganglia of the stomach of the patient. Other phases of the same kind of doctrine were dominant with regard to the relation between the brain and metals. Metals were the simplest and most primitive production of the creative force, and consequently were diametrically opposed to the brain. Metal reduces will to its primitive being. The positive or conscious pole in somnambulists is accordingly peculiarly sensitive to contact with metals, etc., etc.

Not only in the special sciences did this galvanic mythology have its sway, it also became deeply rooted in the fundamental constitution of philosophic thought. The tendency of the scientific age is well illustrated by a passage from Schelling. "In the highest perfection of natural science," he says, "the phenomenal or material element must disappear entirely, and only the laws, or formal element, remain. The more law becomes apparent in nature, the more the hull or wrapping disappears; the phenomena themselves become more spiritual, and at last cease altogether. Optical phenomena are nothing more than a system of geometry whose lines are drawn by the light, and the material nature of this light itself is already doubtful. In the phenomena of *magnetism all trace of matter has already vanished*. . . ." At first sight we might view this tendency as bordering on a genuine idealism, but on closer observation it will be seen that this is not so. It is only a certain conception of matter, matter as a "coarse bulk," and not matter as such that tends to vanish, and what is substituted for it is itself of material origin. In the phenomena of magnetism all trace of matter in the ordinary meaning of the word may have indeed already vanished, but the remaining phenomenon of polarity is not therefore idealistic; it is still material force, and might be called spiritualism or mystic-materialism, but not logical idealism. The illustration which Schelling regards most complete, the illustration of magnetism in which *all trace* of matter has already vanished, shows us clearly the root of this whole tendency to discard "the phenomenal or material element." It is the conception of polarity. Single force or laws of single force could not possibly appear to supply the place of matter; only when force presented itself in the Janus-like form of polarity did it appear able to do this. And only when polarity was read very extensively into the many forces and phenomena of nature did the material element become properly attenuated and appear to vanish. And this is what we find: the conception of polarity being extensively read into the phenomena of nature and the material element as fastly disappearing. There seemed to be polarity in everything. Polarity in the universal law of gravitation, in the form of a ratio of the squares of times to the cubes of distances passed over. Polarity in all mechanical force in its absolute and independent form, namely, the polarity expressed in the union of centripetal and centrifugal force. There is polarity in the colors, the proper objects of optical science. Polarity in the proper objects of mathematical science; for example, in the ratio of the centre to the circumference of the circle. Polarity in more or less explicit form in the proper objects of all the special sciences, inductive and deductive. There is polarity also in the laws of the social sciences. Thus Hegel gives forth a doctrine of social chemism; and the one category of chemism in Hegel's time we saw was polarity. This galvanic chemism is what takes place in the acquisition of a new language. The German "Gäuner-

¹ Werke, I, iii, 340 (quoted from A. Seth, Hegelianism and Personality).

sprache" is a chemism of Hebrew and German. The morals and customs of families, states and nations are all outward manifestations of inward social chemism. The same principle is applied to politics, religion and æsthetics. There are polar opposites in politics; for example, anarchism and despotism, each of which when pushed to its extreme, veers round into its opposite. There are polar opposites in religion, the Father and the Son, and the higher unity in the Holy Spirit. There are polar opposites in æsthetics, in tastes; for example, the French romantic and the antique, the neutralization of which two formed the normal taste under Ludwig XIV. Everywhere in nature, everywhere in experience, that two opposed facts could be found standing near to each other, they were conceived to be, now in more, now in less disguised or conscious form, further examples of the electrical category of polarity. The whole world began to appear as nothing more nor less than an infinity of antinomies. Kant in his studies of the four special objects of cosmology recognized what he termed four antinomies of reason. But why leave them in the "realm of shades?" Why any longer look upon them as dead, static, contradictions of reason? Filled with the living power of polarity, they will become four more of those living contradictions which move the world. The antinomies of reason and the polar antinomies of nature are the same antinomies; and the *vitality* of the latter must be read into the former. And they are not four, but spread out *ad infinitum* throughout the rational constitution of the whole universe; they appear in all objects of every kind, in all conceptions, notions and ideas. Every actual thing was thus conceived to involve the co-existence of polar elements. Every element of nature must have its opposite pole, or, as Hegel says, "its own other." The whole world of experience seemed to fall apart into the quaint polarities of Mind-Nature, Subject-Object, Ego-Non-Ego, Thought-Feeling, Sensory-Motor, Active-Passive, Irritability-Sensibility, Male-Female, Day-Night, Good-Evil, Necessity-Contingency, Pleasure-Pain, Vitality-Mortality, Matter-Form, Attraction-Repulsion, Centre-Circumference, Centripetal-Centrifugal, Universal-Singular, Identity-Difference, Organic-Inorganic, Acid-Alkali, Oxygen-Hydrogen, Magnetism-Electricity, Anarchy-Despotism, Father-Son, etc., etc. Polarity everywhere, polarity everything; this was the fundamental category in all knowledge, in science, socialism, politics, religion, appearing sometimes "with open breast" and sometimes in subtle disguise, but always essentially the same category, whether expressed in such forms as the physio-philosophy of Oken or the social chemism of Hegel.

Such, then, was the condition of the scientific age which gave birth to the philosophical system of Hegel. Knowing this, we are not surprised to find Hegel, as he surveys the world about him, philosophizing thus: "Everything that surrounds us may be viewed as an instance of dialectic. We are aware that everything finite, instead of being inflexible and ultimate, is rather changeable and transient; and this is exactly what we mean by that dialectic of the finite, by which the finite, as implicitly other than what it is, is forced to surrender its own immediate or natural being, and to turn suddenly into its opposite."¹ "Everything is opposite. Neither in heaven nor in earth, neither in the world of mind nor of nature, is there anywhere such an abstract, 'either—or' as the understanding maintains."² "Wherever there is movement, wherever there is

¹ Wallace's Hegel's Logic, p. 128.

² *Ibid.*, p. 192.

life, wherever anything is carried into effect in the actual world, there dialectic is at work. It is also the soul of all knowledge that is truly scientific." "Every abstract form of the understanding, taken precisely as it is given, naturally veers round into its opposite."¹ "Contradiction, above all things, is what moves the world, and it is ridiculous to say that contradiction is unthinkable."

Let us now turn our attention to Hegel's logic with a view to determining what part the category of polarity played in the formation of his system.

As we go on with this investigation let the object of our search be well defined. We recognize in Hegel the laborious and comprehensive student, the patient observer of facts. We recognize in his work the value of the vast number of important facts which pass before us in the "march of the object" towards its completion in the motion. We recognize the profound philosophical criticism of previous systems which accompanies nearly every step of the dialectical evolution. We can agree with many of the general conclusions. But with all these things we have nothing to do. What we must confine ourselves to is the Hegelian philosophy in so far as it is a distinct system. Our question is not concerned with the value of the facts observed and collected, but with Hegel's peculiar interpretation of these facts. It is concerned especially as to the nature of the one fundamental principle of the system. What is it? And with what aptness has it been applied to the facts of experience? Hegel is dissatisfied with the limited problem of the *Erkenntnistheorie* of Kant as to whether the categories are subjective or objective; he is tired of the bare formalism of the Fichtean idealism; and is indignant over the abstract identity of Schelling. With firm faith in the objective validity of reason and strong determination to rid himself entirely of abstract formalism, he plunges anew into the world of experience, grasps his philosophical principle from the essential constitution of objective fact, and rests not until he has followed its evolution into its most concrete details. Such is his profession. Granted there is a sense in which all this is true, our question still maintains its validity. It now formulates itself thus: Has the principle been grasped from the absolute and eternal nature of facts, or has it been taken only from the nature of facts as apperceived under the most interesting scientific category of the age? Is it a principle of *pure* thought or is it founded in experience? Is it eternally true, or has it a psychological basis and history? Or, to state the question more definitely, how far is it a principle of pure thought and how far is it determined by that galvanic mysticism in the midst of which it was evolved?

By making a general survey of the procedure in the logic, one can readily observe that the method and phraseology used are pre-eminently like those used in the science of galvanism. The one principle of movement which is over and over again repeated throughout the whole system is that of the affirmation, negation, unity of the two; or positive, negative, indifference-point. The process begins with being. Being is positive; nought is its negative aspect; the result is becoming. Then the same process begins again. Becoming has a positive aspect—an aspect of immediacy—it is being-determinate. Being-determinate begins the process as "somewhat," which is positive; the negative is "other;" the new result is being-for-self. And so the evolution goes on, the same triple movement being repeated again and again, with no new

¹ *Ibid.*, p. 127.

element save that contained in the variety of facts which present themselves for arrangement.

But this consideration is external. Hegel might be thus indebted to electric science for his peculiar phraseology, and yet have obtained his fundamental principle from an entirely different and supremely higher source. Accordingly, the evidence which is to have validity in determining the question must be internal. What we must do, therefore, is to make an internal criticism of the logic.

If there is one place more than another in all the logic where the *nerve* of Hegel's philosophical principle is laid bare, it is in the doctrine of essence. In this, we find the essential foundation of the dialectic made explicit. And the nerve of the doctrine of essence is the relation of identity and difference. These two categories standing together in a certain peculiar relation, form the basis of the whole logical procedure. In every step of the evolution, we find them actively present. In the doctrine of essence, Hegel, for the first time, makes explicit what he means by them, and what particular kind of relation he conceives to exist between them. If we learn this well, then, we practically learn all.

Hegel begins his account of these categories with a statement of some true and very important facts concerning them. The position adhered to in the "formal logic" with regard to them is stated and criticised. The inconsistency and untenability of such notions as "abstract identity" and "abstract difference" or "mere variety" are clearly set forth. The indivisibility of identity and difference is insisted upon. Whenever we reflect on the notion of identity, we see that it implies difference; whenever we reflect on the meaning of difference, we find that it implies identity, etc., etc. But in all these criticisms and statements of facts, he is not yet stating his principle of interpretation; he is only preparing the way for it. Now let us see how he states his interpretation. He begins thus: "Difference implicit or in itself is a difference of the essence, and includes both the *positive* and *negative*, and that in this way: The positive is the identical connection of self in such a way as not to be negative, and the negative is the different by itself so as not to be positive. Thus either is on its own account, in proportion as it is not the other. The one shows in the other, and is only in so far as that other is."¹ So far anyone will readily observe that what is stated is the theory of the relation between positive and negative in electricity. But he continues: "The essential difference is, therefore, opposition; according to which the different is not faced by *any* other but by *its own* other or special antithesis."¹ This last passage gives us the key to the whole matter. If we fully grasp all that is implied in this peculiar kind of "opposition," in which the different is not faced by *any* other but by *its own* other, it will at once appear clear that the principle cannot be one of pure logic or pure thought. Professor A. Seth, in his work entitled "Hegelianism and Personality," says: "The opposition which Hegel makes his fulcrum is contrary or real opposition; the second is not simply the negative of the first, but both are real determinations of things. But if this is so, then the first does not of itself strike round into its opposite. The opposite arises for a subjective reflection which has the advantage of acquaintance with the real world." This is undoubtedly true. The dialectical evolution cannot possibly be a process of pure thought. The opposition is *real*; the two elements are *real* determinations of *things*, and consequently must be learned through experience. But I think there is still more definiteness implied in Hegel's opposition.

¹ Wallace's Hegel's Logic, p. 189.

It is restricted not only to *real* opposition, but it is a *particular kind* of real opposition. Each element has *its own other*, its own special antithesis. Now this is not necessarily even a matter of experience—that is, of necessary experience. It would require a *particular* experience to know the special opposition of things. The opposition is not of the nature of that opposition with which we are acquainted in general experience—it is a very peculiar kind of opposition. Now what is it? How does Hegel define it? The best definition he can find is the conception of polarity in physics—not the best *illustration*, but the best *definition*. “The conception of polarity,” he says, “which is so dominant in physics, contains by implication the more correct definition of opposition.”¹

Let us stop a moment and reflect. As we read Hegel’s description of his fundamental principle in this chapter on essence, and watch him drawing it out, as he professes, from the rational constitution of things, can we observe whence he is taking it? Is he taking it from logic or from physics? It certainly does not savor of logic. If it is logic, it is certainly an entirely novel kind of logic. Nothing is more detestable in Hegel’s sight than the “ordinary logic.” He takes its matter as his matter, but gives it an entirely new setting. Now what does this new setting amount to? What is he really doing? Is he not just reading into logic the “polarity science” which was so dominant at his time? The conception of polarity had been well spread through the physical sciences by others. Hegel recognizes this. “In modern physical science,” he says, “the opposition first observed to exist in magnetism as polarity, has come to be regarded as a universal law pervading the whole of nature.”² And he approves of this as “a genuine advance in science.” But no one as yet had applied the conception to the sphere of thought. Physicists, when they had any speculation to do in this sphere, still adhered to the old formal logic. And Hegel contemptuously disapproves of this. After urging the conception of “polarity” as the more correct definition of that “opposition” which he makes the fulcrum of his dialectic, he finds fault with the physical scientists thus: “But physics, when it has to deal with thoughts, adheres to the ordinary logic; and it may, therefore, well be horrified in case it should ever expand the conception of polarity, and see the thoughts which are implied in it.”³

I do not mean to say that Hegel is consciously trying to apply the physical category of polarity to logic. He is not trying to give a physical interpretation of thought. His aim and procedure are far above such type of materialism. What he means to do is rather to apply the principle implied in the physical conception to the constitution of thought. But how much of what is implied in “polarity” does he show us? Simply nothing. The one principle or conception which remains with him wholly uncriticised throughout is the conception of polarity. The very kind of polar behavior which we perceive in physical phenomena is exactly the same behavior which we observe in the dialectic. Whenever Hegel reaches this peculiar kind of behavior, he is satisfied; he has no desire to go any further. He never asks whether this behavior is itself rational. As a rational principle, it is as unintelligible in Hegel’s applications of it as it is in the phenomena of electricity. Consequently, it is the bare physical conceit on which forms the type of thought under which he apperceives the matter of logic.

¹ Wallace’s Hegel’s Logic, p. 191.

² Wallace’s Hegel’s Logic, p. 192.

³ Wallace’s Hegel’s Logic, p. 191.

This conception of polarity we find at the heart of all the most important definitions of his principle. "Positive and negative," he continues, "are, therefore, intrinsically conditioned by one another, and have a being only when they are connectively referred to each other. The north pole of the magnet cannot be without the south pole, and *vice versa*. If we cut a magnet in two, we have not a north pole in one piece and a south pole in another. Similarly, in electricity, the positive and the negative are not two diverse and independent fluids. In opposition, the different is not followed by any other, but by its own other. Usually we regard different things as unaffected by each other. Thus we say: I am a human being, and around me are air, water, animals, and all sorts of things. Everything is thus put outside of every other. But the aim of philosophy is to banish indifference and to learn the necessity of things. By that means, the other is seen to stand over against its other. Thus, for example, inorganic nature is not to be considered merely something else than organic nature, but the necessary antithesis of it."¹

The fundamental laws in electrical phenomena are the repulsion of the homogeneous and the attraction of the heterogeneous, which are in reality only two phases of the same law. In this law, Hegel sees the unity of attraction and repulsion. Thus the positive and negative, in so far as they are positive and negative, are heterogeneous, and already involve *repulsion*. But the positive and negative are always attracting each other. Hence, we never find repulsion without attraction. So, conversely, we never find attraction without repulsion. Homogeneity means abstract attraction—that is, attraction as it would exist without repulsion. But the homogeneous always repel; hence, attraction involves repulsion. Now Hegel treats this law as a universal principle of reason, and it is the one law on which he falls back for all his explanations. In this way, for example, he explains infinity. If we look upon the relation between "somewhat" and "other" as mere repulsion—as heterogeneous, we get an endless progression—a bastard infinity. But if we remember in this that the *unlike* always attract, we get the true infinity. The true infinite is not merely the opposition of the "somewhat" and "other," but the unity or attraction of them in their opposition — the unity of attraction and repulsion. In all this, we can readily see that Hegel is not proceeding from a logical source, but rather reading into the laws of logic the law of electric action. The so-called law of attraction and repulsion is not a universal law of reason as Hegel maintains; it is peculiar to the phenomena of electricity. Homogeneity is not absolute attraction nor is it like attraction; neither is heterogeneity repulsion.

Another consideration, closely connected with this, substantiates this view. Hegel's categories are all living, active things; they seem to be quickened with physical force. As Professor Seth says, they take upon themselves flesh and blood and actually walk into the air. Each finite category *induces* its opposite as positive induces negative electricity. Thus the heterogeneity in the "one and the many" is actual repulsion. "The one manifests an utter incompatibility with self, a self-repulsion; and what it makes itself explicitly *be* is the many." So the opposition between "somewhat" and "other" is not merely logical distinction, but real physical change; it is the real alteration or mutability of the physical world², etc., etc. Some explain this by saying that the chief characteristic

¹ Wallace's Hegel's Logic, p. 191.

² Wallace's Hegel's Logic, p. 149.

of Hegel's system is that it is the unity of logic and metaphysics — a logic that is at the same time a metaphysic, and claim this as "the beauty" of the system. But the facts already noted lead us to believe differently. Hegel's logic is not the unity of logic and metaphysics; it is rather the unity of logic and speculative physics; and in this respect, there is no "beauty" in it.

Granted that Hegel got the first suggestion of his philosophical principle in the conception of polarity, it may still be maintained that he rose supremely above it, and latterly used it only as an illustration. A position similar to this is held by Mr. W. T. Harris. "The language which Hegel uses," says Mr. Harris, "shows the road over which he traveled to the thought of this self-active essence presupposed by all phenomena. It indicates his studies of Schelling and his predecessors, Kant and Fichte. Hence, too, his illustration of his thoughts. He calls up the law of universal gravitation as the very notion itself of law as lying behind the play of forces. It is that which constitutes its great significance, he tells us. So, too, electricity, which as simple power manifests itself as self-opposition or polarity of positive and negative. Gravitation, too, has polarization or duality, taking the form of time and space relations, the ratio of the squares of times to the cubes of distances passed over. We can see how Schelling's symbol of polarity and the point of indifference are the original subject of Hegel's investigation here, and that he thought it out in this universal form, changing a symbol derived from a mere particular object, a magnet, into general abstract thoughts—pure thoughts."¹ The process by which the empirical conception is changed into *pure* thought is illustrated thus: "The magnet, for example, was a brilliant metaphor and stimulated reflection at first. But owing to its peculiar limitations, which made it only a magnet and not the World-Spirit, it soon began to mislead. . . . For the magnet's poles are mere north and south directions, and not subject and object as in consciousness."²

We can fully agree with Mr. Harris until he brings us to the process of transforming empirical into *pure* thoughts. The wonderful metamorphosis takes place upon transferring the thought from the magnet to the World-Spirit. Let us not be carried away by the sublime transition. Such a transition avails us nothing. It does not make my conception of atoms one whit purer to say that atoms constitute the essence of the World-Spirit; it only makes it more mystical. Certainly an apperceiving thought is often transformed and enriched through its application to new facts. This is a law of apperception. For example, in the history of science it often happens that some discovery, at the same time it is apperceived, transforms the whole system of our knowledge. No better illustration of this can be found, perhaps, than the discovery of galvanism, which we have already considered. But this psychological fact must be distinguished from that for which Mr. Harris contends. We find that all such transformations and enrichments proceed from the side of experience; that the new observation in order to be enriching must be an actual and interesting *sense* experience; and that apperceiving ideas are very slightly enriched in their application to speculative objects, but rather are made mystical. Consequently, no difference what object, and however sublime it may be, to which an empirical thought may be applied, it can never be changed into a *pure* thought in the Hegelian sense of the term.

¹ Hegel's Logic, p. 70 (Grigg's Phil. Cla., 1890).

² *Ibid.*, p. 71.

Another possible interpretation of Mr. Harris' view is this. The thought is pure from the first. The experience of the phenomena of magnetism serves as the occasion for its first imperfect realization. The transition to the World-Spirit makes it at home with itself and reveals it in its purity. The pure thought is the thought of "self-opposition." But to this we may answer: The principle of self-opposition is not a pure thought, it is only a postulate—an empirical postulate. It has been from the first a postulate of physical science just as the atomic theory is a postulate of physical science; it is of great value as a postulate just as the atomic theory is valuable, but as a *real* principle of pure thought or pure magnetism, or pure anything else, it is as unintelligible as the infinitely infinite number of atoms which would be necessary to the constitution of the physical world.

Schelling's philosophy is based on the symbol of the magnet. But Hegel's principle is an advance over that of Schelling, and this, Mr. Harris from another point of view attempts to show, is a step taken from the physical symbol to pure thoughts. Schelling's absolute corresponds to the "indifference point" of the magnet. Now this indifference point is wholly devoid of polarity, a mere indifference utterly indeterminate—a sort of zero or nothing. The one pole is mind and the other nature, and the absolute essence is the point of indifference, a substance that is neither mind nor matter. This absolute accordingly transcends not only matter, but also intelligence; it is a supreme unity utterly devoid of determination; it is, as Hegel says, no better than the night, in which all cows are black. Now Hegel's conception of the absolute is very different. Schelling laid all stress on the indifference point or identity of the two poles. Hegel conceives that this is important, but that it is not all; the polar opposition or difference is equally as important. Schelling's absolute cannot be called the creator, "for to create is to impart substance and existence, and such impartation would be self-separation and not 'indifference,' but rather a polar difference of positive and negative, or active and passive within itself."¹ This emphasis of difference or polar opposition, then, is the advance made by Hegel. In this, however, he is not at all transcending the symbol of magnetism. He is only presenting a more complete view of magnetic phenomena. He grasps the magnet as a totality. The all-important aspect of it is not the indifference-point: the opposition of the poles is equally important. These two phases of agency always stand together in the conception of the magnet as a totality, namely, the identity of the two poles in the indifference point and their opposition at the poles themselves. Thus we have the supreme law of Hegelism: the unity of attraction and repulsion—the unity of identity and difference without the destruction of either.

The philosophy of Schelling is characteristically distinguished as the philosophy of identity. That of Hegel may be characterized as the philosophy of the syllogism. The syllogism, however, taken "not as it was understood in the old formal logic, but at its real value," in which "it gives expression to the law that every particular thing is a middle term which *fuses* together the extremes of the universal and the singular."¹ The conceptions of both philosophers are based on the conception of magnetism, and the difference between the conceptions is due to the difference in their views of the magnet. For Schelling the magnet was Identity, for Hegel it was the Syllogism.²

¹ Harris' *Hegel's Logic*, p. 71.

² Wallace's *Hegel's Logic*, pp. 41, 42.

What we have accomplished thus far is a consideration of the Hegelian principle as such. We have considered some of the most important points of the definition and illustration which are calculated to give the most direct evidence as to the nature of that peculiar kind of relation which Hegel conceived to contribute the rational essence of things. The New-Hegelians follow him in the general conclusion that the essential nature of the world consists in "relations." But this position is much more general and indefinite than that of the master. His, as we have seen, is a peculiar kind of relation. And from his definitions, descriptions and illustrations of it, our only conclusion is that it is the relation of polarity as presented in the physical phenomena of electricity. Let this suffice, then, for direct evidence; we shall now consider some points of indirect evidence. We shall consider briefly the principle in its application to the problems of philosophy, with a view to determining how far this psychological interpretation will account for some of the chief difficulties and short-comings of the Hegelian philosophy.

Let us first consider the dialectic as an evolution of thought. Is it a purely sympathetic process? or is it after all an empirical process? This is a dispute of long standing among the critics of Hegel. Trendelenburg and his followers maintain that the procedure of the evolution is not an original synthesis, but a sort of empirical synthesis which is the result of a previous analysis or abstraction. All the elements of thoughts, according to this school of critics, in their original form are intimately united in the concrete forms of experience. By abstraction these elements are violently held apart. What is thus violated by abstraction, however, cannot but strive to escape from this forced position; it must strive to complete itself. When this completion takes place there will arise a new conception which contains the former in itself. This new conception, again, will repeat the process; and so the evolution will go on until the full reality and concreteness of perception have been restored. Thus, for example, "if Becoming is clear to us through perception, there may easily be distinguished in it the moments of Being and Non-Being. Thus while day is dawning, we may say 'it is already day,' and also 'it is not day.' We separate and distinguish these moments in Becoming as actually observed, *but without in the least understanding logically* the characteristic of real existence in virtue of which they are present together."¹ The motionless ideas of Pure Being and Pure Nothing could never of themselves give rise to the movement of Becoming unless the idea of becoming were presupposed. The synthesis in the movement, then, is not a true synthesis; it is due to previous experience; a retracing of our steps from the concrete to the abstract. Such is the view of the Trendelenburg school. But perhaps a larger number of critics maintain, on the other hand, that the synthesis is a real one, pure, original. And indeed this view corresponds more faithfully with the profession of Hegel. The open pretence of the dialectic is that it is an entirely presupposition movement; a real evolution of one category out of another. The criticism contained in the dialectic is not the criticism of an external subjective reflection, but an immanent criticism of one category by another; the march of the object itself. And so the discussion goes on. There seems to be a good deal of truth on both sides of the question. From the purely philosophical standpoint the question is a source of real perplexity. Only one of these views can be philosophically true; yet in the Hegelian system both are clearly observable. Now how are we to account for this difficulty?

¹ Trendelenburg, "Logische Untersuchungen," 1, 38.

According to the psychological view for which we are contending, there are two lines of thought which must run parallel throughout Hegel's system: first, there is the series of facts which he brings up for explanation, and secondly, the principle which he reads into these facts. The real facts of thought-evolution which he observes and endeavors to explain, are the facts noted in the view of the Trendelenburg critics; the living synthesis implied in the attraction and repulsion of electric agency is the pure and original synthesis noted by the opposing school of critics.

That the real synthesis apparent in the Dialectic is just the conception of electric synthesis and nothing more is evident from many considerations. It is clearly implied in many facts we have already noted. We have already seen, for example, that the categories are living things, expressing themselves in such forms as physical mutability, etc. And when a category brings about its opposite in the dialectic, it does so not by the power of a mere logical *distinction*, but it does so actually and really, as if by electric *induction*. Again when Hegel speaks of the sciences of magnetism, electricity and chemistry in the *Naturphilosophie*, what does he call them? "The dialectical sciences." He calls the principle of these sciences "dialectic." Hegel's descriptions of the synthetic process are full of such evidences. In all his descriptions of the synthesis one can see no description which will not apply to electrical phenomena. What, then, are we to say? Our answer must be that, in so far as Hegel tells us what the synthetic principle *is*, we are to understand by it nothing more than the principle of electricity. But the advocate for pure synthesis has one more chance. If he has failed to convince us by telling us what the principle *is*, he may accomplish his project by showing us what it *does*. If the principle is one of rational synthesis it must show itself as a source of real development; it must actually develop into the various stages presented in the dialectic. If it can do this we must admit without further discussion that it is a real principle of reason above and beyond the descriptions of it which we have already observed.

But can it do this? A careful observation of the procedure in the Logic will convince any unbiased observer that in this also it fails. The real advances made in the evolution all seem to be made possible only by reference to experience; they belong to the kind of procedure noted by the Trendelenburg critics. Synthetic process, it will be noticed, is always at a standstill; it never develops into anything, but is ever the same old process repeated over and over again. Take, for example, the section of the evolution beginning at identity. Let us suppose that we understand the synthetic process by which identity and difference coalesce in the "ground." Now why does the evolution not stop here? What is the motor power that carries the process out of the ground? Let Hegel answer. "We must be careful, when we say that the ground is the unity of identity and difference, not to understand an abstract identity. Otherwise we only change the name, while we still think the identity of understanding which has been already proved to be false. To avoid this misconception we may say the ground, besides being the unity, is also the difference of identity and difference. The ground, which originally seemed to supersede and swallow up contradiction, thus presents to us a new contradiction."¹ We see by this that the synthetic process which is to take place in the next triad after mediation of identity and difference in the ground, is gotten by a bald repetition of the old process;

¹ Wallace's Hegel's Logic, p. 193.

the ground, which is a category taken from experience in order to be made synthetic, is apperceived as "the *identity* and *difference* of identity and difference." In this we can observe the true method of Hegel's artful procedure. The synthetic principle itself does not develop, but is always static, always the same; and the secret of its activity seems to be that it is repeatedly read into the development that really does take place, namely, the development due to empirical association. This is the method throughout the whole system. Hegel never tires of warning us that such phrases as "being and nothing are the same," or "the unity of being and nothing," and all other such unities, that of subject and object, and others, misrepresent the facts by giving an exclusive prominence to the unity, and leaving the difference which undoubtedly exists in it without any express mention or notice. The immediacy or unity expressed in the third category in each triad is thus only a farce as far as the synthetic evolution is concerned; what must be done in order to get a synthetic movement in each new triad is to repeat the old process. Thus we observe that the so-called synthetic principle has nothing whatever to do with the real development; it does not develop at all, but is only repeated. Hegel, however, so artfully mixes up this repeated synthesis with the steps of the real evolution, that it is very difficult to distinguish them. Hence the double aspect of the dialectic. The substance of our conclusion, then, is this: The evolution of thought in so far as Hegel presents it as synthetic is an evolution that never advances a step, an evolution which is nothing more than the repetition in each triad of the category of polarity; and the development which really does take place is the movement from abstraction to the concrete forms of experience.

The real principle of development in the dialectic, then, is the psychological principle implied in the empirical facts brought up for explanation, and not the principle which Hegel endeavors to read into these facts. And this, we shall find, is the really valuable thing and centre of attraction throughout the whole system, namely, the empirical facts observed, and not the interpretation given. What is, we ask, the great centre of attraction in the Hegelian Logic? Probably his treatment and application of the central categories of identity and difference. Now what is so attractive in his discussion of these categories? Undoubtedly it is some great truth which lies hidden somewhere in his theory of the essential relativity of thought. "All knowledge consists in relations," say the New-Hegelians. "The whole world is essentially made up of thought relations." This is the attractive point. But what is the great truth we find beneath this doctrine of "thought-relations?" It is that the laws of the relativity of thought are ultimately not logical laws at all, but physiological. This is a great fact proved beyond reasonable doubt by experiment, namely, that the so-called "relativity" is ultimately not the relativity of consciousness, but the relativity of sensations. And what makes Hegel's treatment of identity and difference so attractive is that it contains within it a comparatively accurate statement of the laws of discriminative sensibility. In my paper on Natural Realism I endeavored to show that the facts which the realists aimed at expressing were the laws of tactual perception, and that in these ultimate facts of tactile sensibility lay the attractive centre of their doctrine. So here the facts which Hegel is striving to express in this discussion are the physiological laws of discriminative sensibility, and in this lies the really valuable and attractive element of his doctrine. And so in the case of all the categories: the valuable and attractive thing is

not the interpretation given, but the statement of the facts themselves.

We have examined the principle as a principle of development: now let us examine it as a principle of explanation. In this capacity also, we shall find that it does not vindicate its right to be called a principle of universal reason. We said before that the one conception which remains wholly uncriticised with Hegel is the conception of polarity. Now we shall find that his uncritical application of this conception to the nature of reason is the chief source of his errors in philosophical explanation. The powerful opposition which moves the world does not prove itself rational. Its insufficiency as a rational principle presents itself in its root form in the highest stage of the dialectical opposition, the opposition between mind and nature. Nature is the "other" of mind—its special antithesis. We are told that nature is implicitly mind, and therefore ultimately rational. Let us admit that we are satisfied with this half of the interpretation. But there is the other half which is equally important. Nature is the "other" or special antithesis of mind, and in this respect it is irrational. Now how is this phase of nature explained? Hegel occasionally calls it "illusion," but his more explicit statements of the doctrine clearly show that "illusion" does not at all express what he means. And indeed we can readily see the truth of this if we remember that "illusion" is a category which is applicable only to psychological phenomena and not to the nature of reason. The "other," according to Hegel's genuine doctrine, must "have its scope;" it is a real, necessary thing in so far as it is "other," and must not be explained away. It is, in short, a real and definite phase of reason. Now here is the difficulty. The "other" is a real, definite, extensive irrationality which we must not attempt to rationalize, and yet Hegel insists that it is ultimately rational. This difficulty is not merely a little hole that can be picked in the system just at this point: it is a huge insufficiency that pervades all Hegelism, and can be observed in more or less explicit form in every stage of the dialectic. Let us look, for example, at the transition from teleology, which is the last stage of objectivity, to the idea. The finitude of the end or aim in teleology consists in the circumstance that, in the process of realizing it, the material which is employed as a means, is only externally subsumed under it and made conformable to it. The transition to the idea is explained thus: "But, as a matter of fact, the object is the notion implicitly; and thus when the notion, in the shape of end or aim, is realized in the object, we have but the manifestation of the inner nature of the object itself. Objectivity is thus only a shell or covering under which the notion lies concealed." Let us for a time admit the "matter of fact" that the object is the notion implicitly: but what about the opposition which has just been annulled? This is the essential point to be explained, and the only account we get of it at this time is that it is "a shell or covering under which the notion lies concealed." We may understand what is meant by the shell or covering of an oyster or a chestnut, but the shell or covering of reason is a metaphor which means nothing. But the curious thing about it all is that we are not supposed to understand the so-called "shell." It must have its scope as such, and the true explanation of it is that it is inexplicable. While the scope of objectivity is being emphasized, this is the view adhered to, but when the transition to the idea is made, it is subtly abandoned, and the view of ultimate rationality is put in its place. The two views are never harmonized, but each is sacrificed to the other according as objectivity or the idea is emphasized.

Take, as another illustration, the doctrine of contingency. Though "the contingent is only one side of the actual," yet as such it "has no less than the rest of the forms of the idea, its due office in the world of objects." "On the surface of nature, so to speak, chance ranges unchecked, and that contingency must simply be recognized, without the pretension which is sometimes, but erroneously, ascribed to philosophy, as seeking in it a necessary and rigidly fixed law. Nor is contingency less visible in the world of mind. The will, as we have already remarked, involves contingency under the shape of option or free-choice, but involves it only as a vanishing and abrogated element. In respect of mind and its effects, just as in the case of nature, we must guard against being misled by a well meant endeavor after rational knowledge, which would fain exhibit the necessity of phenomena which are marked by a decided contingency, and try, as the phrase is, to construe them *a priori*."¹

In this we see that chance ranges unchecked and must simply be recognized as such. The only explanation that can be given is simply to recognize that it exists in the world, and is in its essential nature irrational and inexplicable. The contingent, however, is only "one side of the actual." The other side is rational necessity, and the side of contingency when reviewed in its union with this, Hegel conceives is some way or other brought into a rational system. But in whatever way we may conceive this to be done we must be careful not to explain away the fact of contingency; it still must have its scope. Now the only possible way on these conditions to bring contingency within a rational system is to "lump it" and tie it mechanically to reason. But this is a mere jumble of words and contradiction of terms. By contingency we mean that we can give no rational account of why things are as they are and not otherwise. And to let contingency range unchecked without seeking in it rational knowledge, to leave it eternally as it is on the surface, and yet attempt to bring it within a rational system, amounts to saying that in the highest stage of reason we can have rational irrationalities. Thus the higher unity of reason in which Hegel harmonizes necessity and contingency is a reason in which anything may be anything else.

The same transparent fallacy may be again illustrated in the doctrine of identity and difference. The "other" of the rational element in this case is "mere variety." Mere variety by itself is untenable, but as the "other" it must have "its scope." It is the most common thing in the whole world. "Usually we regard different things as unaffected by each other. Thus we say: I am a human being, and around me are air, water, animals, and all sorts of things. Everything is thus put outside of every other."² The other side of the doctrine is expressed in the following statement that "the aim of philosophy is to banish indifference and to learn the necessity of things." But this aim of philosophy, according to Hegel's rendering of it, never reaches the inner fibres of the nature of variety—it only regards it externally. It never accounts for the fact of variety. It does not explain it, or even attempt to explain it: it rather regards it as a weak and unimportant thing and treats it with contempt.

We might go on with illustrations, but it seems unnecessary. The same fallacy appears in all the various forms which the central opposition between mind and nature assumes. Nature as the "un aufgelösten Widerspruch" always remains a huge lump of matter, foreign to reason. Hegel seems to maintain that as such it is inex-

¹ Wallace's Hegel's Logic, p. 228.

² Wallace's Hegel's Logic, p. 191.

plicable, and that the true way to explain it is to ignore it. He does give it a kind of explanation, but not a philosophical explanation. It is a sort of wholesale explanation, an explanation which does not penetrate into the inner network of nature, but only gives it an external and mechanical connection in the rational system. The fundamental insufficiency of this explanation is very artfully concealed beneath the veil of the familiar category "immediacy." Immediacy serves as a great box into which he casts all the irrationalities of the world. He then closes up the box, calls it a moment in rational consciousness, and declares that by so doing he has rationalized all.

But Hegel will make one more attempt to overcome the difficulty. He will insist that the opposition between reason and nature is all the time within the bounds of reason. Thought overlaps nature, the subjective overlaps the objective; the former is always wealthier than the latter. And by means of this overlapping of the rational, the irrational is ultimately some way or other made rational. Reason is itself essentially a triple movement, embracing within its necessary activity both the opposition between itself and nature and their ultimate unification. The two movements are only two phases of the one essential activity of reason. Now this view does for a moment seem to lift us out of the difficulty. It is undoubtedly very attractive, and on the surface quite satisfactory. But on closer observation one will observe that such a doctrine holds good only when reason is regarded in the abstract. In all this talk about reason, we never bring into realization what we mean by it. We are, in all probability, thinking of something which has in common with reason very little more than the name. We might, with equal intelligence, talk of anything going through the same movements, for example, electricity. We have seen already that when Hegel regards reason in its actuality, this principle of triple movement is not applicable to it. He fails to read this abstract triple movement in the manifestations of reason in the real world, such as subjectivity and objectivity, identity and variety, necessity and contingency. If we regard reason in the concrete and try to apply this abstract principle to it, we shall find that we are necessarily led into one of two doctrines neither of which satisfies the end which Hegel claims to have accomplished. In the first place the application may mean that the opposition between mind and nature is ultimately wholly done away with; that in the fully realized idea it does not exist. But this would amount to a mere formal subjective type of idealism in which the whole value of objectivity would be lost, an idealism which would be ignored by Hegel. In the second place it may mean that the rigidity of the opposition is always maintained; that it is an eternal necessity of reason. This is undoubtedly Hegel's meaning. But the opposition is at the same time harmonized. Now what must be the nature of that higher unity which makes this harmony possible? It cannot be called reason—that is, the reason which is opposed to the irrational—for if that were the case the harmony of the opposition could mean nothing else than its complete destruction. Nature, we must remember, is opposed to the absolute and complete nature of reason; it is its special antithesis: the opposition is between rational and irrational. Consequently the one may conquer the other and thus bring about harmony, but in order to retain the opposition and yet become harmonized a third party is necessary in which they must receive this new relation. Thus, in this case, the principle of unity of the rational and irrational which Hegel still

calls reason, is in reality a principle which transcends both mind and nature, a principle identical with the absolute of Schelling.

The Hegelian principle, then, whatever it may be, is clearly not an ultimate principle of reason. Reason bends under its power. Rationality and irrationality are alike moments in it. The opposition which it makes between mind and nature is an opposition which transcends rationality, and any attempt to bring it within a rational system lands us either in subjective idealism or in a doctrine of blank identity. This is the case when we keep reason before us as a concrete reality. Only when we regard it in the abstract does the principle of triple movement seem applicable to it. Now how can we account for all this? What can the principle be? Putting together all the facts we have noted, have we not good reason to conclude that it is just the principle of polarity as observed in electric agency? In electric phenomena alone do we seem to experience an opposition which is annulled and at the same time retained. Is not this the principle of movement which Hegel reads into the laws of reason when he regards it in the abstract, and which lands him in contradiction when he attempts to make it concrete? The relation between mind and nature—what is it? Is not nature the negative *induced* by the *positive*, mind, and at the same time *attracted* by it? The powerful logical distinction which moves the world, which is not merely a *distinction* but a *living* power immanent in all physical movement—is it not electrical repulsion? The ultimate unity of the opposition or the “return-into-self”—does it mean anything more than what we understand by electrical attraction? Will not this interpretation give us an insight into the Hegelian philosophy which will clear away for us many of its perplexities, and account for its principal inadequacies?

We have traced briefly the influence of the discovery of galvanism on the scientific thought of Hegel's time. We have seen how the conception of polarity tacitly worked itself into the network of the whole intellectual world and became the central apperceiving thought in nearly all scientific and philosophic speculation. We have seen how the world consequently fell apart into an infinity of polar antinomies. In Hegel's Logic we have seen that his definitions and descriptions of his fundamental philosophic principle are nothing more than descriptions of the conception of polarity. We have considered this principle as a principle of development, and have found that, though it presents the appearance of a real synthetic movement, it plays no part in the real evolution of thought; that it remains the same throughout the evolution and is all through completely satisfied by the description of polarity. We have examined it as a principle of solution in the problems of philosophy and have found that it does not prove itself a principle of universal reason; that in this respect also it proves itself to be nothing more than the principle of galvanism. Our natural conclusion, then, is this: The age in which Hegel lived compelled him to stand between two great worlds, each full of contradictions. Behind him was the logical world pregnant with the Kantian antinomies of reason: before him lay the physical world charged with the polarities of electricity. The latter being his world of experience, becomes a part of his life, and constitutes his apperceiving thought; and in the life of this world he reads the former. It is thus he unites the two. This is his monism. This is his logic that is at the same time a metaphysic.

What, then, is the value of Hegelism? It is valuable in two respects. First, there is value in the facts which he so extensively and so accurately observes. And from this point of view there is

value in many of his general conclusions, for example, the acceptance, in a very general way, of anthropomorphism as the highest possible world conception, and the interpretation, in the same general way, of thought as a development. In these "generalities," as such, must consist the whole metaphysical value of the system; in Hegel's peculiar rendering of them, in the particular kind of anthropomorphism or development on which he insists, there is none. So, after all, the metaphysical value of the system may be said to be in the aim rather than in the accomplishment; it is ideal rather than real. But, secondly, there is another value which I think is more important and which is specially brought out by this investigation. It is a psychological and pedagogical value. In his endeavor to make the so-called ultimate principles of reason as exhibited in the science of logic conform to his newly conceived principle, Hegel necessarily freed thought from the fixed and apparently ultimate forms in which it had lain bound for centuries. In the successful application of his principle to logic there is involved a deep criticism of the nature of thought, which reveals the fact that the fixed conceptions and so-called ultimate principles of reason are merely finite forms of the "abstract understanding." In this spirit of radical criticism the most final forms of logical and mathematical science are set down as crystallizations of the empirical imagination: retaining, however, their due office as stages in the development of thought. In this criticism of the old forms and in the substitution of his own principle as the final form of thought, Hegel, no one can doubt, has met with wonderful success. Now what is the underlying possibility of this success? Hegel would have us believe that the secret of the whole matter is that he has discovered the one fundamental principle of reason. But our examination of the nature and application of this principle will not warrant this belief. The great truth revealed as a result of Hegel's successful treatment is not, as he professes, the *positive infinity* of thought, but rather its wonderful *plasticity*. The truth of the freedom of thought has been revealed, but not in the sense that the principle of freedom or positive infinity has been grasped. The work done by Hegel may be regarded as a great psychological experiment, through which he brings to light what a wonderfully plastic thing thought is. And in this consists the great educational value of Hegelism. A thorough study of it brings into activity the latent plasticity of the mind, thus lifting it out of its old ruts and prejudices, and giving it in consequence a spirit of independence and freedom.

If our main thesis is true, its value will be not so much its own truth as what it suggests. We are led to question that the fundamental principle of the universe has yet been discovered. Has philosophy yet attained that universal standpoint which it claims as its own, or is it still only one of the great number of things that go to make up the sum of life? The aim and spirit of philosophy, the aim which seeks to know the essential nature of things and gain a world-conception devoid of presupposition, we can safely endorse, but are we sure that the methods used are the best for realizing that aim? How far has the aim been accomplished? As we look over the various systems, do we find them presuppositionless? There seems to be an imperfection in the philosophic method, which leaves it satisfied with bringing to light some dominating presupposition of thought, without inquiring into its nature and history. It leaves it uncriticised and regards it as ultimate, when in truth it is far from being so. Thus what Hegel does is to bring into consciousness the central presupposition or apperceiving

thoughts of his intellectual world: but he does not ask what it is. By psychological criticism, we found it to be the conception of electric agency. In the history of galvanism it has its history. If, then, the imperfection of the philosophic method leaves it satisfied with *revealing* the presupposition, is it not the business of psychology to make good this imperfection by telling *what it is*? Psychology will not take the place of philosophy, but it can criticise and correct its methods. The philosopher must be a psychologist. In the history of philosophy there are scores of categories which, one may safely conjecture, have a psychological history. There are "unities" and "higher unities" and "double-faced unities;" "subjectivity" and "objectivity" and "subject-objectivity;" "self" and "not-self" and "return-into-self," etc., etc.; all undoubtedly significant and useful to a certain extent. But who can fully realize what is meant by them? Are they not all presuppositions awaiting psychological criticism? Again, in the history of science, if the discovery of galvanism has furnished the psychological history of one system of philosophy, may we not find the histories of others in the development of gravitation, wave-motion, and other epoch-making discoveries? Is there not a great work suggested here—a work that may be of inestimable value to both psychology and philosophy? What new relation it may reveal between these two departments of knowledge, and what benefits may accrue to both, will be seen only when the work is done. But the foretaste of the results is sufficient to warrant the investigation. Philosophy would at least be made conscious of its prejudices and delusive metaphors, and thus be equipped for a revolutionary advance to a higher standpoint. Psychology may find in the history of philosophy psychological phenomena in the widest bearings and most highly developed stages; as well as obtain the results of naturally-performed experiments which are unattainable in the laboratory.

I have much pleasure in expressing my indebtedness to President Hall for first suggesting that I should investigate the discovery of galvanism, with a view to finding the psychological basis of Hegelism; and also for valuable direction in the investigation.